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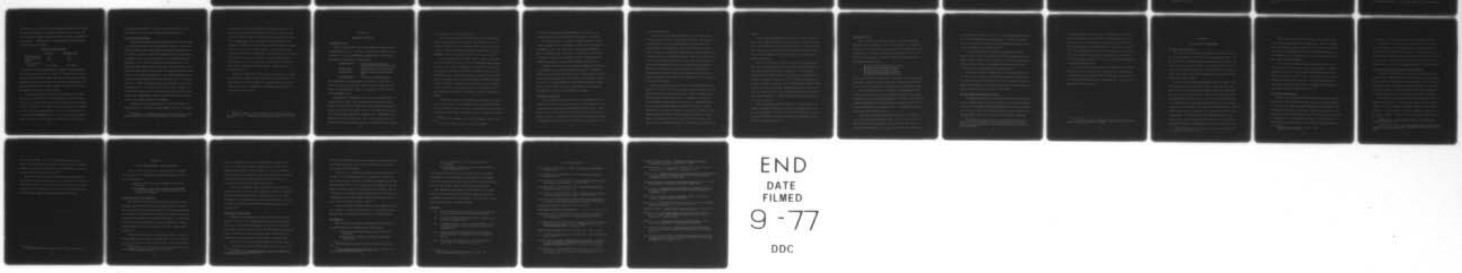

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MANAGING TOTAL ACQUISITION TIME:
A New Priority for Major Weapon Systems

STUDY PROJECT REPORT
PMC 77-1

James B. Lincoln
LTCol US Army

FORT BELVOIR, VIRGINIA 22060

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MANAGING TOTAL ACQUISITION TIME:
A New Priority for Major Weapon Systems

Study Project Report

Individual Study Program

Defense Systems Management College

Program Management Course

Class 77-1

by

James B. Lincoln
LTCol US Army

May 1977

Study Project Advisor
Mr. John Mathias

This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management College or the Department of Defense.

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: MANAGING TOTAL ACQUISITION TIME: A New Priority for Major Weapon Systems

STUDY PROJECT GOALS:

To consider and evaluate the problem of ever-increasing acquisition time on major systems. To identify the need for revising current priorities to emphasize time rather than cost control.

STUDY REPORT ABSTRACT:

The report analyzes the background and evolutionary changes that led to the current weapons acquisition management environment that emphasizes cost controls over all other management controls. The resulting lack of emphasis on time has brought about significant increases in total acquisition time for major systems. Specific causes of increased acquisition time have been lengthy decision processes, contracting procedures and other indirect factors such as economic conditions and multinational considerations. Current conditions of rapidly advancing state of the art and improving enemy capabilities point out the need for reduced, not increased, acquisition time, from inception to operational capability.

Subject Descriptions:

1. Lead time
2. Management controls

NAME, RANK, SERVICE
James B. Lincoln, LTC, USArmy

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EXECUTIVE SUMMARY

This report is an analysis of the problem of increasing acquisition time in weapons system development. Over the past several years the evolutionary changes in the acquisition process have emphasised controlling costs, while de-emphasizing control and concern for time. Some of the primary contributors to "time growth" in weapons acquisition have been the various decision processes that occur, contracting procedures, and to a lesser extent the economic health of the economy and the defense industries.

Major conclusions reached in this analysis are as follows:

- The proliferation of cost control measures has significantly increased acquisition times.
- A weapons acquisition institution exists that complicates and delays the process.
- Acquisition decision processes that include the DSARC process, the user, and budget procedures contribute to increased acquisition times.

Total acquisition times of ten to twelve years for a major weapon system are intolerable in today's environment of rapidly changing technology and continually improving enemy capabilities.

SECTION I

INTRODUCTION

In recent years there has been greatly increased emphasis on all management controls in weapons system development except one: time control. There has been a significant reduction in the former emphasis on establishing and maintaining a schedule that would insure reasonable lead time to Initial Operational Capability (IOC). Modern science and engineering has greatly accelerated the rate of advance of the "state of the art," a situation which makes reduced acquisition times more critical than ever. Nevertheless, there is now less emphasis on time than ever before.

The vital importance of time should not be overlooked, as illustrated by America's lack of preparedness for World War I, World War II and Korea. It is a resource to be managed with other critical resources. A system can become obsolescent by the time it is deployed. The adage in the R&D business that "the better is the enemy of the good enough" relates to delay and cost increases as a result of constantly applying state of the art improvements during development. The tendency has some elements of virtue to offset the adverse elements of delay and cost. Systems developed in today's environment however, may be even worse off, since a "good enough" system at inception is so much delayed by management's (cost) control measures that it loses the race with the advance in the state

of the art. Furthermore, during the delay period, the old and possibly obsolete system remains in the hands of the operational user as a dangerous dilution of military strength. Thus the delay not only increases the life of the old system, but also increases the possibility that obsolescence has begun to overtake the new system.

The current acquisition environment may be forcing us into the vicious cycle of "too little, too late," too late as with the surprising appearance of Sputnik, and the unsophisticated but effective weapons of the Viet Cong, too little as with most present systems with stretched schedules and increased fund requirements, too frequently compensated for by cutting production quantities.

As one writer seemed to predict just as the extensive cost measures were being implemented:[1]

> As the pendulum in systems acquisition swings steadily nearer to full emphasis on costs, and away from the value of time, there is a strong possibility that we may be approaching the point where we get less, rather than more value for our defense dollar.

[1] John S. Baumgartner, "Comment on the Value of Time and Its Effect on Defense Systems Acquisition," Defense Management Journal, July 1972, Pg. 53.

SECTION II

PURPOSE AND METHODOLOGY

This paper will investigate the weapons acquisition "time growth" problem. Various aspects of the acquisition process and its effects on time will be considered, not only to point out activities that tend to delay the acquisition process, but also to provide more realistic schedule information to acquisition managers. Before considering the current environment, an overview of the evolutionary changes that have occurred in the past years will be discussed, and how cost control measures have been to some degree successful, but at the expense of time.

Some difficulty was experienced in attempting to collect useful data. Few projects retain historical data in general, and time related data in particular. Information was obtained from a number of major projects, but this information cannot be considered a scientific survey. Although the data used to back up findings presented is somewhat limited, it is adequate to make general judgements and hopefully will stimulate further interest and study.

SECTION III

THE CHANGING ACQUISITION ENVIRONMENT

> It is of prime importance that Army R&D establish guideposts into the future for the orienting and directing of its programs. Reducing lead time is the R&D mandate, because of the political urgency of our times and because science and technology are increasingly the basis of military power and national survival.[2]

These words by the former Director of Army Research point out the emphasis fifteen years ago. During the past fifteen years, there has been a marked change in the acquisition environment. These changes reflect the early concern for "lead time" which slowly gave way to concern for management processes, followed by primary concern for costs. The changes can be traced in a series of Army Regulations:

- In 1961, the Army had a Regulation titled, "Reduction in Lead Time" with the stated purpose of "...actions required by Department of the Army which will contribute to a reduction of lead time from inception of an idea for materiel to equipment in the hands of U.S. Army troops."[3]
- In 1968, the Regulation was updated and retitled, "The Management Process for Development of Army Systems," and its purpose was "...to outline the process by which Army Systems are developed and fielded."
- In 1974, the new title was "Basic Policies for Systems Acquisitions by Department of the Army" and its purpose was to state "...policies to minimize costs in acquiring materiel systems."[4]

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[2]MG W. J. Ely, as quoted in Army Research and Development Magazine, Sept-Oct. 1976, pg. 32.

[3]AR 11-15, Sept. 1961.

[4]AR 1000.1, Nov. 1974.

This fifteen year cycle is not untypical of the evolutionary changes that have occurred in DOD management during the same period, and points out how today's highly structured, intensely managed acquisition process evolved. The overall process has become institutionalized with micro-management to the extent that the careful step by step process often seems more important than the end product. The Commanding General, U.S. Army Training and Doctrine Command, General William E. DePuy, recently provided a cautious but hopeful appraisal of the situation:

> We are just emerging, thank God, from a period in which the process of weapons systems acquisition was regarded as more important than the product...
>
> We have institutionalized the development, testing evaluation and analysis aspects of weapons systems acquisition until there is an institutional bias toward prolonging and complicating the process, rather than changing and simplifying it.[5]

Another veteran Army professional went to the trouble to lay out most of the process on what he calls "The Scroll" that runs the entire length of a large conference room. His "womb to tomb" chart shows 153 steps, 53 on the vertical axis involving "higher headquarters," 26 involving the user, 54 involving the developer, and 20 others.[6] A similar chart that highlights required cost analysis steps shows that a total of 33 formal cost analyses are required during the acquisition cycle.[7] It would be almost

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[5] Introductory Remarks, AORS XV Symposium, Oct. 1976.

[6] Dr. John McDaniel, Director, Missile Research and Engineering Lab, Huntsville, Ala., described in Armed Forces Journal, July '76, pg. 16.

[7] Defense Systems Management College Instructional Chart, Ft. Belvoir, Va.

impossible to determine how many times a given weapon system is acted on in the Planning, Programming, Budgeting System (PPBS) cycle that begins as long as five years before funds are actually needed.

It would also be difficult and perhaps invite controversy to attempt to identify a basic shift in philosophy of top DOD leadership. One could select any past Secretary of Defense and find strong quotations supporting both cost control and cutting lead time. For example, Secretary McNamara had a public image of being very tough on cost control, but key officials of his era recall that he was just as tough on extended lead times.

Deputy Secretary of Defense David Packard ('69-'72), who was the key instigator of the reordering of the acquisition process, would probably feel that an increase in time was a necessary trade off to gain control of costs, but may be unaware of the extent of the increases that have occurred.

Success in the Control of Costs

How successful has all the emphasis on cost been? Although few officials would say that costs of major systems are now totally under control, most would say that costs are no longer out of control. For example, cost growth information presented in the Selected Acquisition Reports (SAR) for major systems clearly shows considerable improvement since the early years. If cost growth is adjusted for inflation and quantity changes, cost growth has been reduced from about 7% per year in the early '70s to about 3% last year. This successful effort to bring costs under control has not been without its penalties. The virtually unnoticed tradeoff has been loss

of control of time. It is now clear that the total acquisition time to develop and field weapon systems has expanded significantly since the early '70s. This conclusion is supported by information also contained in the SARs for major systems. Acquisition time to Initial Operational Capability (IOC) for SAR systems is as follows:

AVERAGE YEARS TO IOC

	June 1971	December 1976
Original Estimate	5.5	6.5
Revised Estimate	7.5	9.0
Slippage	28%	38%
"Cost" of Schedule Extension	$1.4 Billion	$2.8 Billion

The information also shows that different categories of weapon systems have suffered more than others. Aircraft, for example, are now reflecting about nine years to IOC compared with five and one-half years in 1971. Missiles have had the greatest increase in schedule extension (61%). The huge sums attributed to the extended schedules in both 1971 and 1976 further support the old adage, "Time is Money"!

The information on time to IOC shown in the SAR does not reflect, in most cases, several years of concept formulation required for major systems. Also, some current systems are a follow-on to earlier systems that were terminated. For example, the XM-1 tank program was initiated in 1972, but only after utilizing almost ten years of technology from the terminated XM803 & MBT70 programs. The major new fighter programs (Teen series) "started" after many years of IR&D, concept formulation

and prototype development. Clearly, a more accurate figure for total time to IOC for a major system would be twelve to fifteen years.

Roots of the Time Problem

Why does the acquisition process often result in a ten year or longer cycle to develop and field a new weapon system? This is a complex question that cannot be answered by merely describing the acquisition process. As a result of a series of studies[8] that sought to bring the acquisition process under control, the process has grown more complex through implementation of a wide range of management and decision controls. Some officials feel that these measures are the price to be paid in order to bring the process under control. Unfortunately, the apparently unnoticed additional price is the extended acquisition time. The problem continues and even expands as a natural outgrowth of the fact that there was no real expressed concern for extended acquisition times in the early studies or their implementing procedures, nor is there any real concern today. Officials at all levels would certainly express concern about the excessive times required to field a new weapon system, but such concern is not clearly reflected in any directives, policy documents or regulations.

Emphasis on costs was the primary factor that brought about a reduction in the use of networking techniques (PERT, CPM, etc.) by military

[8]Examples are: Blue Ribbon Defense Panel, Commission on Government Procurement and several Defense Industry Association studies.

project offices, and their counterpart project offices in industry.[9] The control system now prescribed by DOD, Cost/Schedule Control System Criteria (C/SCSC), measures all variances between planned and actual in terms of dollars only. The proliferation of this system throughout the acquisition community has been yet another step in increasing the emphasis on cost and decreasing the emphasis on time. To say that the weapons acquisition manager must constantly seek a balance between cost, schedule and performance has become a misnomer. The acquisition manager of today manages costs, and accepts whatever schedule and performance results, without employing real tradeoff analysis. There is little or no "balancing" process.

The lack of management of "life cycle time" has allowed the acquisition institution to continually add on little noticed increments of time. A major portion of the time increments are brought about by the various decision processes that are imbedded in the acquisition process and will be considered in the next section.

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[9]Wayne L. Hinthorn, "Industry Management of Commercial Defense Systems Programs," Defense Systems Management Review, Winter 1976, pg. 49.

SECTION IV

DECISION PROCESSES

The DSARC Process

With the implementation of the Defense Systems Acquisition Review Council (DSARC) process, a milestone or incremental acquisition process was initiated. The revised DOD Directive 5000.1 lists the following decision points or milestones for major systems:

MILESTONE "0"	Program initiation (approval of Mission Element Need Statement only)
MILESTONE I	Demonstration and Validation Phase
MILESTONE II	Full Scale Engineering Development Phase
MILESTONE III	Production and Deployment Phase

These milestones and decision points are preceded by a long series of activities at each level below OSD. Each Service has developed its own Systems Acquisition Review Council, or some form of review to ensure a favorable DSARC decision.

Unfortunately, the DSARC process has developed far beyond the original intent of its creator, former Deputy Secretary of Defense, David Packard. He felt the need for OSD to insure that the Project Manager was given a clear mission with adequate resources, and OSD decision review at the critical transition points in the acquisition cycle. Although the current DOD directive still calls for the same three basic decision points as envisaged by Packard, in practice the number of decision points has expanded

to more than three for most major systems.

There is little doubt that the DSARC process has accomplished its purpose of permitting only well-managed, cost-effective and low-risk systems to proceed to the next acquisition phase. Many major projects must gain a favorable DSARC decision before critical funds will be made available, contracts can be signed, or other key events can occur.[10]

Several months prior to a DSARC, system managers must begin to prepare by initiating a series of pre-briefs, discussions with principals at both the service SARC and DSARC level, and careful coordination of the Decision Coordinating Paper (DCP), the principle document used in the DSARC process. Experience has shown that this process can require three to four months, plus at least another month to actually receive the decision itself.[11] The resulting four to five month time period is difficult to add to the project schedule, but for the sake of the important events that usually follow the DSARC, the planning time should be included on the schedule.

A considerable portion of the DSARC preparation time occurs at the service level and below. Army Regulation 15-14 on the DSARC/ASARC process contains an extensive check list, covering such areas as technical and operational assessment, acquisition strategy, and logistics assessment.

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[10] In theory, the DSARC makes no final decisions or approves any funds.

[11] Based on a survey of projects with recent DSARCS.

To enter the Validation Phase (DSARC/ASARC I), for example, the regulation points out no less than 98 items that must be accomplished.

The preparation time, pre-briefs, coordination and other actions consume significant time in insuring the standards and requirements of the DSARC are met. Also, since years can elapse between DSARCs, there are usually new key managers at the various levels from the Project Manager, to the service headquarters to OSD. Additional time is consumed bringing these people up to the required knowledge level.

Is all the time required to pass through the DSARC important as far as contributing to the successful fielding of the system? Probably not, yet the process will continue as long as costs of weapon systems are more important than acquisition time. It is important for acquisition managers at each level, to include DSARC and Service SARC principles, to insure that the excessive time required to traverse the process is minimized, and decisions are rendered as expeditiously as possible.

The Impact of the "User"

As the acquisition process has become more institutionalized, the influence of the user seems to have fallen off. As user influence decreased, so did the urgency associated with fielding the important systems. Since the user need is closely related to the "threat" that the new system is designed to counter, a changing threat has also caused variations in the type systems that have received priority, as systems constantly try to "catch

up" with a revised threat.

The role of the user should not stop after he has clearly specified the mission and performance requirements of the system. Any uncertainty in the mission needs after the initial phase can add greatly to total acquisition time. This uncertainty can take the form of lack of commitment or support for the established requirements, or adding requirements not considered with the original system design. Systems have been stretched out or even terminated because the user was never satisfied with the performance capability of the system, and constantly changed system requirements. On the other hand, some systems that started out with a strongly supported need and mission requirement later suffered from an extended acquisition because future project sponsors were not as convinced of the need for the system.

The user will make the point that the need and mission requirement change after a system "locks in" its baseline performance parameters, and some consideration for change must be made. This is a reasonable viewpoint and one the developer must consider. Although the developer has been contending with this problem for many years, a totally unstructured process exists for bringing about user changes in the system. What is badly needed is a procedure to consider and incorporate qualitative system changes similar to the manner in which engineering changes are accomplished. The present procedure is mostly based on high ranking system sponsors or users bringing pressure to bear on developers to make certain

changes.

As the acquisition institution has grown more complex, the user influence has lessened to the point where there is little real pressure by the user to expedite the process and get the system fielded. Priority systems such as the "Big Five" have been used by the Army with some input by the user, but these techniques are usually driven by budget considerations rather than user need.

There is a need for increased user interface in the development process, and a constant information flow to user units to psychologically and technically prepare them for the new equipment. A "New Equipment Training Team" and publications received just prior to receipt of the new equipment is inadequate preparation. The U.S. Army Training and Doctrine Command has recently organized the TRADOC System Manager (TSM) concept for each new system which should help solve some of these problems. It remains to be seen whether the TSM will become merely another add-on to the institution or a useful means to provide constant user interface with the developer.

The user's feelings about the real need for a system should be continually communicated to both the developer and the budget managers in the service headquarters. Otherwise, priority decisions (that will include program acceleration or stretchout) will be made by "budgeteers" based on dollar availability, not user need.

The Budget Process

The orderly and successful progression of a program through the numerous steps of the PPBS is now more difficult than ever. Acquisition managers at all levels need to be well informed on the budget process, and the potential for reduction of programmed or needed funds. Some of the most critical annual budget events that require the personal attention of the acquisition manager include:

- FYDP Updates (January, May, October)
- POM Formulation (February—May)
- OSD "Issue" papers (June—July)
- Budget Estimates (July—September)
- Apportionment (September—October)

There are certainly other budget events of importance, such as reprogramming actions, unfunded requirements and the obligation and commitment process. All have potential for delaying the project if improperly managed.

The recent implementation of the Budget and Impoundment Act will mean that project sponsors may be providing information to two additional committees and the new Congressional Budget Office (CBO). The additional analysis accomplished by the CBO has already had impact on several projects, and will increase the amount of background information required of those who testify and defend projects.

The stop-start budget approach used by Congress is a technique to save current dollars against future dollars. However, there seems to be little appreciation of the long range effects of program stretchout or reduction in production buys. For example, the current year cutback in the

B-1 bomber buy from eight to five aircraft, "saving" $280 million this year will add over $1 billion to total program costs. The XM-1 tank program that was delayed due to the political effects of standardization incurs costs of $2 to $3 million for each month of delay.[12]

Since all programs must be continually justified in terms of the dollar resources required, it is simple to see how the budget process contributes to total emphasis on costs. In service reviews and Congressional budget testimony, there are some inquiries about performance factors in addition to costs, but a total absence of concern for time.

The effect of the 1973 Yom Kippur War caused a momentary concern for time, as large quantities of equipment were produced on a rush basis to replace equipment lost by the Israelis. The ease with which the required funds for this equipment was approved points out the special (wartime) conditions necessary before there is any concern for time.

The Determination and Findings Procedure

The ASPR's list seventeen exceptions that permit procurement actions to be accomplished outside of formal advertising. Some of these exceptions require that a Determination and Findings (D&F) be processed and approved prior to contract award. In the R&D environment for major contracts, the exception route is used almost exclusively where the market conditions

[12]The Congress has not been the cause of delays in this program. Unilateral actions by former Secretary of Defense Rumsfeld, not agreed upon by Congress or the Army, caused the delays and increased program costs considerably.

are inappropriate for formal advertising. The ASPR fails to recognize this fact and requires the processing of a D&F through the Secretarial level for contracts over $100,000. A recent study analyzed R&D D&F's that passed through a service headquarters for a period of six months in 1976. The study found that the average processing time from dispatch by the contracting officer to approval and arrival back at the contracting officer's location was 58 days.[13] An average of 38 days was consumed in the service headquarters alone.

A period of only two months may seem insignificant except for those programs that were required to delay contract award and signing while awaiting the return of an approved D&F. The D&F procedure is but one of the ASPR requirements that affects acquisition time. Other factors are considered in the next section.

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[13] Major W. H. Schwend, The Project Engineer Prepares the D&F, DSMC Research Paper, 76-2, Nov. 1976.

SECTION V

CONTRACTING PROCEDURES

The Source Selection Process

One of the most time consuming segments of the acquisition cycle is the activities leading up to award of a major weapon system contract. The three critical steps of RFP preparation and issue, source selection activities, and contract award vary greatly as far as time devoted to each. Of concern to the acquisition manager who overseas all three steps should be the total time required, since little meaningful project progress can occur until the final step is complete.

In 1969, a Logistics Management Institute study found that of major Navy competitive and noncompetitive contracts studied, the total time required from receipt of the Procurement Request (just prior to RFP issue) to contract award averaged 275 days. Today even more time is required. RFP preparation for a major contract averages two to four months, with two to three months for contractor's preparation of bids. Source selection requires three to six months, with contract award following within a month.[14] Thus the entire process can approach a year in length and often has required much longer. For a major system that requires at least one major contract and two others requiring somewhat reduced time, more than two years will be consumed in the administrative contractor selection process.

[14] Based on information received from selected Project offices and review of major contract awards.

This two year period presents a lucrative area to examine with a view towards speeding up the total acquisition time. All source selection plans should strongly consider eliminating, for example, the Source Selection Advisory Council (SSAC) and allow the Source Selection Evaluation Board (SSEB) to pass recommendations on source selection directly to the Source Selection Authority (SSA).

A recent procurement innovation that threatens to add even more time to the process is the four-step source selection process, described in DOD Directive 4105.52. The sequential submission of technical data first, then cost data, attempts to reduce the common abuses of technical leveling and auctioneering, and buy-ins. One of the initial indications from some sixteen major defense contracts trying out the procedure is that more time is required to reach contract award.[15]

The Federal Acquisition Act

Many of the current issues in contracting and procurement are considered in the Congressional bill, S 3005, known as the Federal Acquisition Act. Passage of the bill would further implement recommendations of the Commission on Government Procurement, and address many of the current issues in procurement and contracting. One of the key issues is the question of competitive vs. non-competitive procurement. As already discussed when the D&F process was considered, a competitive procurement is often

[15] Federal Contracts Reports, 3-21-77, A-14.

not possible, nor is it always in the best interests of the government.

An example of the acquisition time (and money) to be saved in the issue of competitive vs. non-competitive procurements involves the Army's AN/TPQ 37 Artillery Locating Radar. A study made prior to the production phase showed that competitive procurement would save 2-6% in life cycle costs, but increase total acquisition time by 13-28%. A non-competitive contract would save eighteen months in total acquisition time.[16]

The Procurement Process and Government Legislation

An important consideration concerning the contracting process is the use by the government of the procurement process to enforce various social, economic, environmental and safety legislation. The most recent legislation, and that with the greatest potential for impact on acquisition time are the policies of the Environmental Protection Agency (EPA) and the Department of Labor's Occupational Safety and Health Act (OSHA).

An example of the impact of EPA standards involved the Universal Engineer Tractor project. At the time when engine design was nearly complete, it was determined that the engine exhaust exceeded accepted standards. A complete engine redesign was required, resulting in a project slip of a full year.[17] Similarly, the Army's Stinger missile project

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[16] Tyburski, et.al., Decision Risk Analysis, AN/TPQ37 Radar, USAECOM Study, June 1975.

[17] Major James Graham, The Impact of Environmental Requirements on Defense Acquisition Management, DSMC Research Paper, 76-1, May, 1976.

felt the impact of OSHA. After the rocket motor design was nearly finalized, it was discovered that a material used in the motor was banned by OSHA. Redesign cost the project more than $800,000 and set back that segment of the project by several months.[18]

It is likely that new major energy policies being implemented will soon begin to use the procurement process as a framework for enforcement. A mechanism is needed to evaluate the impact of legislation on the procurement process. The new Office of Federal Procurement Policy seems to be the ideal agency to monitor and continuously evaluate this impact.

[18] Information obtained from Stinger Project Office, February 1977.

SECTION VI

FINAL OBSERVATIONS AND CONCLUSIONS

There are other factors that have a potential effect on acquisition time, but are not as "controllable" as those already discussed. Two of the most important are:

- Basic "health" of the defense industries and economy in general.
- Multinational considerations, including standardization, conversion to metrics, and outright purchase of foreign systems and subsystems.

Economics of the Defense Industries

The "*Profit 76*" *study of the defense industry* found that low profit margins, unused capacity and difficulty obtaining financing are some of the current problems in the defense industries. The Study also found that these industries are inhibited from investing in new equipment and capital goods due to the risks and uncertainty of future business. A related problem has been reduced productivity, an issue that has become a national concern in the past five years, existing in both defense and non-defense industries.[19]

Productivity problems increase production lead times. These lead times constitute a major portion of acquisition time, and can account for two years or more of the time to field the system. The lead time problem

[19] Richard J. Power, "Productivity: A Defense Department Perspective," Defense Management Journal, April 1977, pg. 2.

has been compounded by the current DOD acquisition strategy of almost total risk reduction before a full production release decision. DSARC Milestone III decisions often call for "limited" or "low-rate" production releases followed by incremental production releases. These incremental decisions permit more efficient production "fixes," but increase total costs of production and increase production lead times.

The new Army Regulation 1000.2 discourages a low-rate initial production approach, and further states, "production rates will be established based upon manufacturing efficiency, operational demand, and resource availability." It is a hopeful sign that the same regulation makes clear that a solution to a suspected or potential system deficiency is not a low production rate.[20]

Multinational Considerations

Multinational considerations are having an impact on an increasing number of programs. After being pushed into the background during the Viet Nam years, standardization has been "rediscovered" and potential cost savings has brought about a demand, rather than objection to standardization. Virtually every major new program must carefully consider the applicability of standardization or program delays are highly possible.

Closely related to the standardization issue is the metrics requirement. The United States is the only NATO country not "on" metrics. It is

[20] AR 1000.2 (draft) Operating Policies for Systems Acquisition by the Department of the Army, January 1977.

more and more difficult to justify the development of a non-metric system, and virtually all programs are required to address the issue during the early stages of system definition.

To date, the U.S. military has purchased two foreign systems "off the shelf." The Marines purchased 110 AV-8A Harrier aircraft from Great Britain, but have experienced considerable maintenance and supply support problems.[21] The U.S. Army purchased the rights to produce the Roland air defense system from a French-German consortium. What was considered to be a straightforward technology conversion with minor U.S. modifications became a $265 million project that will require almost six years to attain operational use by U.S. units.[22]

Clearly, multinational considerations can easily complicate and delay a program. Purchase of foreign systems or co-production projects (like the F-16) are not always the "easy way out" of long lead times.

DOD Initiatives

DOD has given some thought to techniques that would assist in decreasing lead times and acquisition times. These include:

- Use of standard commercial parts and "off the shelf" technology.
- Insistence on "scrubbing"and tailoring specifications and standards.

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[21] Government Accounting Office Report LCD 76-450, January 4, 1977.

[22] Annual Defense Department Report, FY 1978, Secretary of Defense Donald H. Rumsfeld, Pg. 170.

- Use of simulations to assist and speed up test and evaluation.
- Encouraging the Congress to reduce stop-start funding and program stretch-outs.[23]

These limited measures have yet to have any real effect on reducing acquisition time. Perhaps what is required is another war or Sputnik event, the events that spurred this nation to build the atomic bomb in less than five years, and put a man on the moon in less than ten years.

The engineering and management talents that made these events possible are still present in this nation today, and they are capable of managing the dual priorities of cost and time. Our survival as a nation may soon depend on such a change in priorities.

Conclusions

- The proliferation of cost control measures has significantly increased acquisition time for major weapon systems.
- A weapon acquisition institution exists that complicates and delays the acquisition process.
- Acquisition decision processes, budget procedures and contracting procedures are some of the causes of increased acquisition time.
- When overlooked or improperly managed, multinational considerations have a significant effect on the acquisition process.
- The health of the economy and the defense industries has a major effect on acquisition time and costs.

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[23] Defense Department Report FY 1978, op. cit, pg. 266.

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